

REMARKS

Applicants request reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1-7, 9-19, and 21-25 are pending in this application, with Claims 1 and 13 being independent. Claims 8 and 20 have been cancelled without prejudice or disclaimer. Claims 1, 4-7, 9, 10, 12, 13, 16-19, 21, 22, and 24 have been amended. No new matter is believed to have been added.

Claims 1-24 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-21 of co-pending Application No. 09/818,581. Applicants respectfully request that the provisional rejection be held in abeyance until either this application or Application No. 09/818,581 is deemed to be in condition for allowance. (MPEP 804.)

Claims 1, 2, 4-6, 12-14, 16-18, and 24 have been rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 5,913,193 (“Huang”). Claims 3, 7-9, 15, and 19-21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of U.S. Patent No. 6,366,883 (“Campbell”). Claims 10, 11, 22, and 23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of U.S. Patent No. 6,490,563 (“Hon”). Claim 25 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang in view of Campbell, and further in view of Hon. These rejections are respectfully traversed.

Independent Claim 1 of the invention, as amended, recites a speech signal processing apparatus including distortion obtaining means for obtaining a modification distortion between synthesis units before and after modification; selection means for selecting synthesis

units based on the modification distortion obtained by the distortion obtaining means; and speech synthesis means for performing speech synthesis based on the synthesis units selected by the selection means. Independent Claim 13, as amended, recites a method having steps that generally correspond to the features recited in Claim 1.

According to the invention, modification distortion is generated between synthesis units before and after modification, and synthesis units are selected based on the modification distortion.

The primary reference to Huang relates to runtime acoustic unit selection for speech synthesis. Huang states that a speech synthesizer converts a phonetic string into a corresponding string of diphones or other acoustical units, and selects the best instance for each of those units. Thus, Huang selects synthesis units which are diphones or other acoustical units.

The speech synthesis method of Huang is specifically directed to the use of longer acoustical units (units longer than a phoneme), as against the use of smoothing techniques. As explained at column 1, beginning at line 41, choosing a longer acoustical unit usually entails employing diphones, since they capture the coarticulatory effects between phonemes (effects of adjacent phonemes on a given phoneme). The use of longer units reduces the number of boundaries, thereby improving the quality of synthesized speech. However, the use of such longer units also requires greater memory capacity and poses problems of inadequate coverage of input text by models in a system. Huang's method is designed precisely to overcome these specific problems in order to exploit the advantages provided by use of acoustical units longer than a single phoneme.

According to Huang, in order to overcome the problems entailed by the use of longer acoustical units discussed above, multiple instances of acoustical units are generated from training data, and these multiple instances are then pruned to a robust set of instances. Huang's method of speech synthesis then selects the best sequence of instances, that is, the sequence that minimizes the spectral distortion between boundaries of adjacent instances. Thus, Huang's method eliminates the need to smooth or alter the acoustical units.

Accordingly, Applicants submit that Huang teaches the selecting of synthesis units based on concatenation distortion, and not on modification distortion.

Therefore, Applicants submit that the independent claims patentably distinguish the invention over Huang. Additionally, the secondary references have been considered, and Applicants submit that they fail to address at least the noted deficiency as to selecting of synthesis units based on modification distortion. Reconsideration and withdrawal of the §§ 102 and 103 rejections are respectfully requested.

Applicants submit that the dependent claims are allowable for the same reasons that the base claims from which they depend are allowable, and further due to the additional features that they recite. Individual consideration of the dependent claims is requested.

Applicants submit that the application is in condition for allowance. Favorable consideration and passage to issue are respectfully requested.

Applicants' undersigned attorney may be reached in Washington, D.C. by telephone at (202) 530-1010. All correspondence should continue to be directed to the below-listed address.

Respectfully submitted,

  
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